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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,633	02/13/2004	Geoffrey Alan Scarsbrook	248810US2CONT	5368

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EXAMINER

MONDT, JOHANNES P

ART UNIT PAPER NUMBER

3663

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/777,633

Applicant(s)

SCARSBROOK

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 2-10 and 14-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 11-13, 31, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date ____.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

The Declaration under 37 CFR 1.132 filed 9/6/06 is sufficient to overcome the rejection of claims 1, 11-12, 31, 33 and 34 based upon Marinelli et al the form as amended because Marinelli does not specifically recite a single crystal diamond for which the data on the electrical properties were published. Comments on Remarks are included below under "Response to Arguments".

Information Disclosure Statement

The examiner has considered the items listed in the Information Disclosure Statements filed 2/13/04, 5/12/04, 7/20/05, 9/6/06 and 10/13/06. Signed copies of the Form PTO-1449 acknowledgments are herewith enclosed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. The term "high" in "high breakdown voltage" (line 5 of **claim 1** and in "high current" in line 5 of claim 1, - and through dependency in **claims 11-13, 31, 33 and 34**, is a relative term, rendering the claims indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
2. The term "long" in "long carrier lifetime" in lines 5-6 of **claim 1**, - and through dependency in **claims 11-13, 31, 33 and 34**, is a relative term, rendering the

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claims indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

3. **Claims 1, 11-13 and 31-34** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the term "on state" as recited in claim 1, line 6, is indefinite, because the amount of charge carriers that are excited in the "on" state is not at all quantified in the specification. All electrical properties claimed, i.e., resistivity, current, lifetime, and electron and hole mobilities, as well as charge collection distance, crucially depend on the abundance of excited charge carriers. It therefore is not known what would constitute the meets and bounds of the claimed subject matter.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. **Claim 1** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over either claim 4 or claim 5 of USPAT 7,128,974 B2 (to Scarsbrook et al).

An obviousness-type double-patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 is generic to all that is recited in claim 4 of the allowed claims in 10/739,014. In other words, claim 4 fully encompasses the subject matter of claim 1 and therefore anticipates claim 1. Specifically, a "layer of single crystal CVD diamond having a thickness of 2 mm" as recited in independent claim 1 of the reference is not narrower in any sense than "a single crystal diamond prepared by CVD" as recited in claim 1 of the application. Furthermore, with regard to the enumerated characteristics: the condition 2 in the independent claim on which said claim 5 depends means that at 300 K the average carrier mobility $(\mu_e + \mu_h)/2$ multiplied by the lifetime τ

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exceeds $10^{-6} \text{ cm}^2/\text{V}$, and hence $\tau (\mu_e + \mu_h) = \delta/E$ (where δ is the charge collection distance and E is the electric field) certainly (by a factor ≈ 2) exceeds $10^{-6} \text{ cm}^2/\text{V}$ it follows that at 300 K a charge collection distance measured at an applied field of $1 \text{ V}/\mu\text{m}$ is at least $100 \mu\text{m}$ (see Marinelli et al as cited previously, Eq. (1) on page 3216, left column). In other words, conditions 1 and 2 in the reference claim 1 are jointly equivalent to condition 1 therein, the latter being an inequality only optionally made stronger, which is allowed anyway within the context of the inequality. Furthermore, the indefinite nature of the "high breakdown voltage" as claimed in condition (ii) of claim 1 of the application has been noted above (see rejection under 35 USC 112, second paragraph), and "high current" in the on state is favorably influenced by the rather high values for electron and hole mobility: to that extent measures for high breakdown voltage and high ON current follow from conditions (5) and (3)-(4) of the independent claim 1 in the reference, respectively. Finally, conditions 3, 4 and 5 in claim 1 of the reference are identical to conditions (iii), (iv) and (i) of claim 1 in the application, while condition 5 of the reference augmented by claim 4 of the reference together ensure that condition (v) in claim 1 of the application is met. Claim 5 of the reference is narrower than claim 4 and hence also anticipates claim 1 of the application.

2. **Claim 1** is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 5 of copending Application No. 11/486,421. The reasons are identical to those put forward in support of the obviousness double patenting rejection of claim 1 in view of either claim 4 or claim 5 in USPAT 7,128,974 provided above.

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This is a provisional obviousness-type double patenting rejection.

Response to Arguments

Applicant's arguments, see Remarks, filed 9/6/06, with respect to the rejections of claims 1, 11-12, 31, 33 and 34 under 35 USC 103(a) have been fully considered jointly with the Declaration by inventor and are persuasive. In particular, Marinelli et al do not specifically teach a single crystal diamond. Therefore, the rejection has been withdrawn based on the claim language *as amended*. However, upon further consideration, new grounds of rejection are made in view of noted indefiniteness under 35 USC 112, second paragraph, of the present claim language, while the provisional obviousness double patenting rejection has been re-written in light of noted anticipation and allowance. Claim 13 has been included in the rejections.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM

November 27, 2006

Patent Examiner:


Johannes Mondt (Art Unit: 3663)